EB/TA Prodction Analysis
APPS Production Data

Transactions	May #	May %	June2-June15 #	June2-June15 %	Total #	Total %
Creates	2,609	11%	1,247	12%	3,856	11%
Sets	2,608	11%	1,060	10%	3,668	11%
Gets	292	1%	195	2%	487	1%
Events	18,324	77%	8,334	77%	26,658	74%
Total Transactions	23,833		10,836		34,669	

Successful Transactions	May #	May %	June2-June15 #	June2-June15 %	Total #	Total %
Creates	2,446		1,115		3,561	
Sets	2,455		989		3,444	
Gets	286		193		479	
Events	18,324		8,334		26,658	
Total Successful Transactions	23,511	99%	10,631	98%	34,142	98%

Unsuccessful Transactions	May #	May %	June2-June15 #	June2-June15 %	Total #	Total %
Creates						
Resource Limitations	44		101		145	
Fallback Reporting	95		10		105	
Trouble Ticket Already Exits	24		21		45	
Total Unsuccessful Creates	163	1%	132	1%	295	1%
Sets						
Resource Limitations	61		42		103	
No Such Object Instance	21		13		34	
Trouble Report Change Denied	71		16		87	
Total Unsuccessful Sets	153	1%	71	1%	224	1%
Gets						
No Such Object Instance	6		2		8	
Total Unsuccessful Gets	6	0%	2	0%	8	0%
Events	0		0		0	
Total Unsuccessful Events	0	0%	0	0%	0	0%
Total Unsuccessful Transactions	322	1%	205	2%	527	2%

Note: Percentages based on the total number of transactions

EB/TA Production Analysis
CCT Test Usage

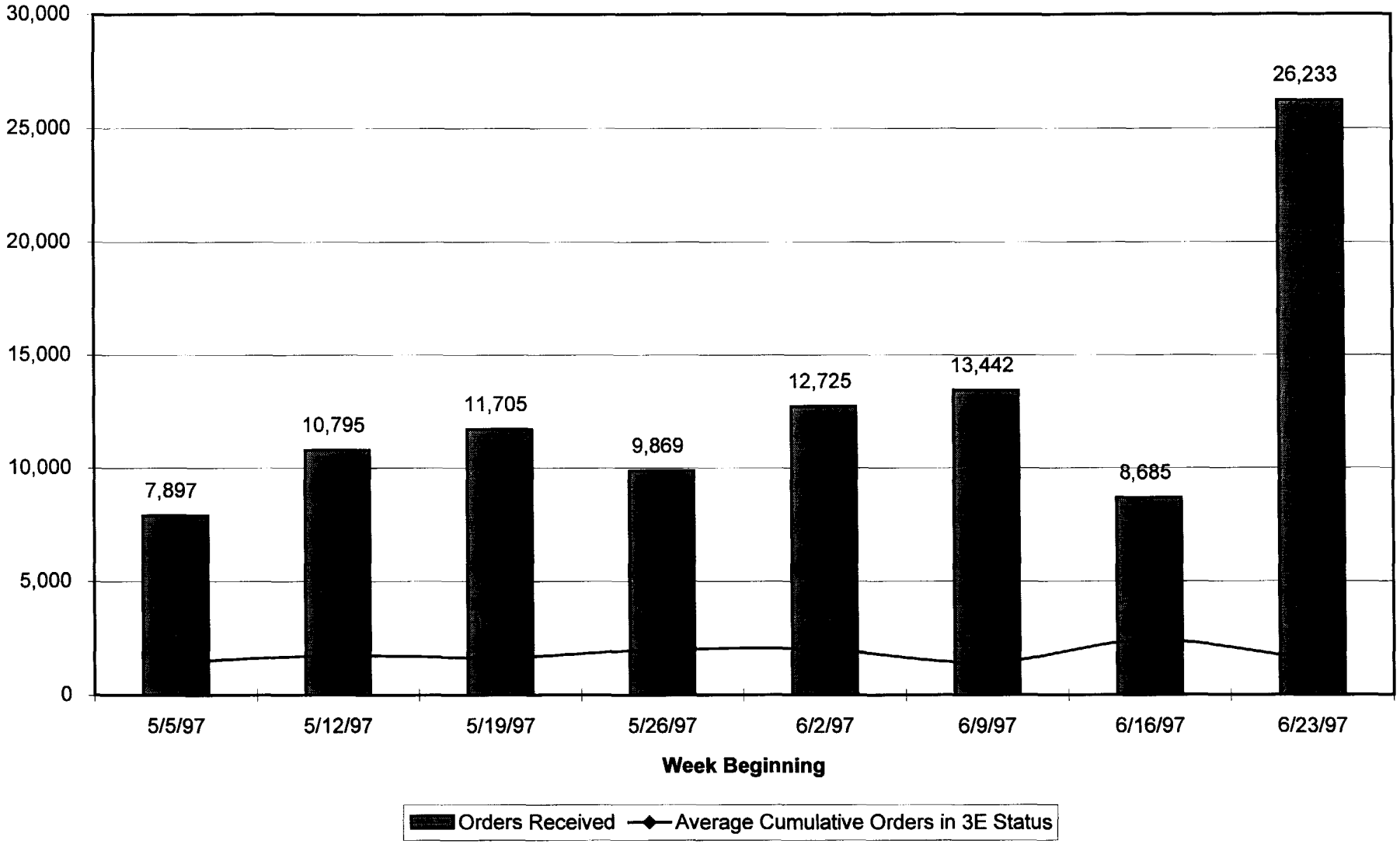
Transactions	May12-June1 #	May12-June1 %	June2-June15 #	June2-June15 %	Total #	Total %
Creates	1	5%	10	16%	11	13%
Sets	1	5%	2	3%	3	4%
Gets	3	16%	4	6%	7	0%
Events	14	74%	47	75%	61	77%
Total Transactions	19		63		82	

Successful Transactions	May12-June1 #	May12-June1 %	June2-June15 #	June2-June15 %	Total #	Total %
Creates	1		3		4	
Sets	0		1		1	
Gets	0		4		4	
Events	14		47		61	
Total Successful Transactions	15	79%	55	87%	70	85%

Unsuccessful Transactions	May12-June1 #	May12-June1 %	June2-June15 #	June2-June15 %	Total #	Total %
Creates						
Resource Limitations	0		0		0	
Fallback Reporting	0		4		4	
Trouble Ticket Already Exits	0		3		3	
Total Unsuccessful Creates	0	0%	7	11%	7	9%
Sets						
Resource Limitations	0		1		1	
No Such Object Instance	1		0		1	
Trouble Report Change Denied	0		0		0	
Total Unsuccessful Sets	1	5%	1	2%	2	2%
Gets						
No Such Object Instance	3		0		3	
Total Unsuccessful Gets	3	16%	0	0%	3	4%
Events	0		0		0	
Total Unsuccessful Events	0	0%	0	0%	0	0%
Total Unsuccessful Transactions	4	21%	8	13%	12	15%

Note: Percentages based on the total number of transactions

Reseller 3E Analysis - Region



Reseller 3E Analysis - Region

Week Beginning	Average Cumulative Regional Orders in 3E Status During the Week	Percent of Total Orders Received	Total Orders Received (Electronic and Manual)
	A	A/B	B
5/5/97	1,448	18%	7,897
5/12/97	1,738	16%	10,795
5/19/97	1,641	14%	11,705
5/26/97	1,999	20%	9,869
6/2/97	1,988	16%	12,725
6/9/97	1,413	11%	13,442
6/16/97	2,410	28%	8,685
6/23/97	1,534	6%	26,233

Ameritech Filing Support
Capacity Analysis

Capacity Requirements

Manual Volume
(Orders per Month)

Includes:
- Volume forecast
- Manual fallout
- Churn

X

Throughput Time
(Minutes per Task)

Includes:
- Order processing
- Error correction
- Handling inquiry calls
- Calling to expedite orders, provide technical support and request clarification from customer

÷

Available Time
(Minutes per Service Rep)

Assuming:
- 8 hour shift with two 20 minute breaks
- 8 hours of overtime per week

=

Capacity Requirements
(Service Reps)

Number of Service Representatives

Ameritech Filing Support
Capacity Analysis

Assumptions

THROUGHPUT

- Standard Customer Service Reps shift is 7 hours and 20 minutes a day (8 hour shift less two 20 minute breaks)
- Each Employees will work an 8 hours of overtime per week
- Time to process Resale orders varies based on class of service:
  - Simple orders - POTS
  - Complex orders - all others
- 14% of all Resale orders are complex and 86% are simple
- Only simple Resale orders can be processed automatically, i.e., without manual intervention

VOLUME

- Projected monthly volumes were provided by Jim Styf, General Manager of AIIS Service Centers, and incorporates:
  - Actual order volumes for January through May
  - Ameritech Marketing Department's estimate of lines that will be lost by year-end
  - Forecasts provided by CLECs
  - For each CLEC that did not provide a forecast, an estimate of expected monthly volumes based on past performance
- Orders for End Office Integration (EOI) are for additional trunks, in groups of 24
- Long-term solution to number portability will not require manual processing and will take effect in October
- Volume forecast for short-term number portability is 60% of volume forecast for unbundled loops
- 35% of orders submitted electronically will fallout for manual intervention

Ameritech Filing Support Capacity Analysis

Calculation Assumptions

Churn Factor:	
Jan-97	1.00
Feb-97	1.00
Mar-97	1.00
Apr-97	1.00
May-97	1.00
Jun-97	1.00
Jul-97	1.00
Aug-97	1.00
Sep-97	1.00
Oct-97	1.01
Nov-97	1.02
Dec-97	1.03

Fallout Rate		
	35%	of Resale Orders
Resale - Simple	21%	of Total Resale Orders
Resale - Complex	14%	of Total Resale Orders

Overtime per Person	0	Hours
Analysis Period (i.e., Month, Day, Year)	Month	
Days per Work Week	6	Days

Resale Service Distribution:	
Simple (POTS only)	86%
Complex (All services except POTS)	14%
	100%

Rates:

Errors After Order Completes		
Resale	27.55%	of Total Orders
Unbundled	3.89%	of Total Orders
Outgoing Calls	10.00%	of Total Orders
Incoming Calls	1.34	Calls per Manual Order

Throughput Times:

Resale		
Simple Order	9.3	Minutes per Order
Complex Order	47.4	Minutes per Order
Outgoing Calls	8.6	Minutes per Call
Incoming Calls	10.0	Minutes per Call

Unbundled		
Number Portability	25.0	Minutes per Order
Loop Order	30.0	Minutes per Order
EOI Trunk	45.0	Minutes per 24 Trunks
3E Error	7.3	Minutes per Error

Ameritech Filing Support
Capacity Analysis

Manual Volume (Orders per Month)	X	Throughput Time (Minutes per Task)	÷	Available Time (Minutes per Service Rep)	=	Capacity Requirements (Service Reps)

Capacity Requirements

(Fallout = 0.35) (Days/Wk = 6)	Resale		Unbundled Loops and Number Portability		EOI Trunks		Total	
	Manual Demand	Required Reps	Manual Demand	Required Reps	Manual Demand	Required Reps	Manual Demand	Required Reps
Jan-97	1,685	6	5,182	17	129	1	6,996	24
Feb-97	2,286	8	3,474	11	510	3	6,270	22
Mar-97	3,599	13	3,406	11	285	2	7,291	26
Apr-97	9,386	31	3,405	11	292	2	13,083	44
May-97	17,357	57	5,754	18	302	2	23,413	77
Jun-97	53,803	175	13,550	42	313	2	67,666	219
Jul-97	70,647	230	21,347	65	323	2	92,317	297
Aug-97	77,691	253	29,144	89	333	2	107,168	344
Sep-97	83,339	270	36,941	111	344	2	120,624	383
Oct-97	84,797	276	27,961	90	354	2	113,112	368
Nov-97	84,263	274	32,834	105	365	2	117,462	381
Dec-97	82,410	268	37,707	121	375	2	120,492	391

Ameritech Filing Support
Capacity Analysis

Demand Forecast

	Resale Manual Demand			Unbundled Manual Demand			
	Electronic Orders	Faxed Orders	Total Orders	Loop Orders	Number Portability	EOI Trunks	EOI Orders
Jan-97	134	1638	1,772	3,239	1,943	3,100	129
Feb-97	807	2004	2,811	2,171	1,303	12,243	510
Mar-97	2612	2685	5,297	2,129	1,277	6,845	285
Apr-97	14627	4267	18,894	2,128	1,277	7,000	292
May-97	29107	7170	36,277	3,596	2,158	7,250	302
Jun-97	88554	22809	111,363	8,469	5,081	7,500	313
Jul-97	116276	29950	146,226	13,342	8,005	7,750	323
Aug-97	127871	32936	160,807	18,215	10,929	8,000	333
Sep-97	137167	35331	172,498	23,088	13,853	8,250	344
Oct-97	138184	35593	173,777	27,961	-	8,500	354
Nov-97	135968	35022	170,990	32,834	-	8,750	365
Dec-97	131687	33919	165,606	37,707	-	9,000	375
	922,994	243,324	1,166,318	174,879	45,826	94,188	3,925

Jim Styf, AIIS General Manager-Customer Service, provided this forecast.

Ameritech Filing Support
Capacity Analysis

Available Time per Service Representative

Total Days per year		312
Unavailable Days per year		
Vacation	15	
Floating Days	5	
Holidays	10	
Continuing Training	5	
Administrative Tasks	12	
Personal Time	2	
Sick Days	4	
Total		53
Available Days per year		259
Minutes per day-Std		440
Minutes per day-OT		-
Available Minutes per year		113,960
Available Minutes per period		**9,497 per Month**

For this analysis, we assume a 6-day work week (which is equivalent to to working 8 hours of overtime per week)

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of Application of Ameritech Michigan Pursuant to Section 271 of the Telecommunications Act of 1996 to Provide In-Region, InterLATA Services in Michigan	)	CC Docket No. 97-137

Joint Reply Affidavit of Richard J. Gilbert and John C. Panzar on Behalf of Ameritech Michigan

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY

1. We reiterate our conclusion that Ameritech's entry into the provision of long distance service furthers the public interest. The public interest equates with the welfare of U.S. consumers, not with the welfare of the firms participating in these markets. This Commission should resist attempts by the commenters to expand the public interest test in ways that will deny U.S. consumers the benefits of de novo entry in the provision of interLATA service.[1]

2. Opening the local exchange to competition, with the checklist operational and not mere paper compliance, promotes consumer welfare and is in the public interest. However, we reiterate our belief that Ameritech is unlikely to discriminate against unaffiliated interLATA providers, because of lack of ability, regulation, and the threat of litigation. As we show below, models put forth by commenters indicate that Ameritech's entry into interLATA service is likely to increase consumer welfare and thus be in the public interest.

3. The empirical evidence from telecommunications markets in which local exchange companies provide access services to competitors, such as cellular, Internet service, and information services, also indicates that downstream participation did not lead to discrimination nor to a lack of cooperation. Moreover, we show that these experiences, many of which we cited in our first affidavit, are pertinent to the issues raised by commenters, and cannot be just dismissed out of hand.

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1 In this reply affidavit we review and analyze the arguments made by intervenors in the following submissions in this proceeding, CC Docket No. 97-137:

Affidavit of Stephen R. Allen and Dean A. Gropper on behalf of AT&T Corp., AT&T Exhibit A
Affidavit of William J. Baumol on behalf of AT&T Corp., AT&T Exhibit B
Affidavit of B. Douglas Bernheim, Janusz A. Ordover and Robert D. Willig on behalf of AT&T Corp., AT&T Exhibit C
Affidavit of Robert H. Bork on behalf of AT&T Corp., AT&T Exhibit D
Affidavit of R. Glenn Hubbard and William Lehr on behalf of AT&T Corp., AT&T Exhibit L
Affidavit of Nicholas S. Economides and John W. Mayo on behalf of AT&T Corp.
Affidavit of Kenneth C. Baseman and Frederick R. Warren-Boulton on behalf of MCI Telecommunications Corporation, Exhibit A
Affidavit of Robert Hall on behalf of MCI Telecommunications Corporation, Exhibit C
Affidavit of Dr. Carl Shapiro on behalf of Sprint Communications Company L.P.

4. Further, we demonstrate that many of the positions taken by the commenters' experts are contradictory or inconsistent with their own current or past positions. For example, in numerous other proceedings Professors Baumol and Willig defended the appropriateness of above-cost access charges and the effectiveness of imputation rules.[2] Affidavits submitted by Professors Economides and Mayo and by Drs. Baseman and Warren-Boulton in this proceeding show that under certain plausible assumptions a LEC would not have an incentive to discriminate against unaffiliated downstream competitors.[3] Seven years ago Sprint's expert Professor Shapiro predicted dire consequences if the BOCs were to be allowed to enter the information services arena, alleging at the time many of the arguments that are being alleged now in this proceeding.[4] We show that his predictions have since been contradicted by the successful experience of the information services marketplace. In a subsequent proceeding, Professor Shapiro then submitted that the MFJ's interLATA restriction should be lifted, noting that allowing RBOC entry downstream would have been in the public interest,[5] even at a time when the competitive checklist and other safeguards of the Telecommunications Act of 1996 ("the Act") were not in place.

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[2] See Baumol, William J., and J. Gregory Sidak, (1994A), Toward Competition in Local Telephony, The MIT Press & The American Enterprise Institute, Washington D.C., 1994. See also Baumol, William J., and J. Gregory Sidak, (1994B), "The Pricing of Inputs Sold to Competitors," Yale Journal of Regulation, vol. 11, no. 1, pp. 171-202, and testimony by Baumol & Willig in Clear Communications vs. TCNZ 1992: Baumol, William J. and Robert Willig, (1994C), "Brief of Evidence: Economic Principles for Evaluation of the Issues Raised by Clear Communications Ltd. on Interconnection with Telecom Corporation of New Zealand Ltd."

[3] See Economides and Mayo Affidavit, Baseman and Warren-Boulton Affidavit.

[4] Affidavit of Carl Shapiro attached to the Joint Opposition to Motions for Removal of the Section II(D)(1) Restriction on the Provision of Information Services in *United States of America v. Western Electric Company, Inc. and AT&T*, submitted by Commerce Clearing House, Inc., Dialog Information Services, Inc., The Dun & Bradstreet Corporation, Knight-Ridder, Inc., MacMillan, Inc., Times Mirror, The Washington Post Company, West Publishing Company, Civil Action No. 82-0192 (HHG), October 17, 1990. Hereafter referred to as the Shapiro CCH Affidavit.

[5] See Affidavit of Robert G. Harris and Carl Shapiro in support of Pacific Telesis Group's Request for a Waiver to Permit It to Provide Interexchange Services to Customers in California, January 26, 1995, and Reply Affidavit of Robert G. Harris and Carl Shapiro, May 24, 1995, in *U.S. v. Western Electric & AT&T*, Civil Action No. 82-0192 (HHG).

5. The "checklist" requirements of the Act will also have a profound impact on the nature of rapidly developing competition in local service. The unbundling and non-discrimination requirements have to be taken into account when applying the standard industrial organizational framework to this industry. Our final section takes this approach when reviewing some of the incorrect assertions about local service competition put forth by commenters' experts. As we show below, the evidence and experience to date suggest that approval of Ameritech's application will on the one hand increase the welfare of interLATA consumers, and on the other not decrease the welfare of Michigan local service consumers. We consequently believe that approval of Ameritech's application would be in the public interest.

II. THE PUBLIC INTEREST TEST

A. Our Consumer Welfare Definition of the Public Interest Is Compatible with the "Open Market" Standard

6. In our previous affidavit we equated the public interest with the welfare of consumers. Actions that lead to lower quality-adjusted prices for consumers are therefore in the public interest. This view is consistent with that put forth by Professor Schwartz on behalf of the DOJ, where he recommends that to evaluate an interLATA application the FCC consider the likely effects on consumer welfare across both local and long-distance service, and is also consistent with the pronouncement of AT&T's expert, Professor Baumol:

> "There would appear to be little reason to continue current entry restrictions... The public interest never gains by preventing competition ... or by shielding firms against the competition of more effective rivals"[6]

7. Freedom of entry and exit in the provision of local exchange and access services is important, as such openness likely will improve consumer welfare, by providing local consumers with more and better choice at lower prices. Whether entry actually occurs depends on the

[6] Baumol and Sidak (1994A) pp. 117-118.

conditions of the market, and we need not observe substantial actual entry for consumers to reap the benefits of openness, as some entry plus the mere threat of yet more entry may be sufficient. Thus, compliance with the Act's checklist and a local exchange that is open to competition ensure that there will be benefits in the provision of local service in the BOC applicant's territory, a premise implicit in Professor Schwartz' affidavit when he notes that *"the local market must be irreversibly open"* but that *"fully effective local competition is not a prerequisite."*[7]

B. Professor Shapiro's Test

8. Commenters such as Professors Shapiro and Schwartz recognize three principal modes of entry in the provision of local services:

- provision using entirely self-supplied facilities;
- provision using some self-supplied facilities plus unbundled network elements (UNEs) leased from the incumbent
- resale of service provided entirely through incumbent-owned facilities.

We agree with Professor Schwartz that *"All the above entry modes can serve valuable competitive roles."*[8] And we believe that compliance with the Act's checklist achieves these goals. The Act preempts any statutory prohibitions on new entry into local service provision, and requires RBOCs seeking interLATA authority to provide interconnection, UNEs, and service for resale.

9. We however respectfully disagree with Professor Shapiro that *"use on a commercial scale of the new access arrangements needed to support all three modes of local entry envisioned in the Act [facilities-based, unbundled elements, and resale] demonstrates that competitors are*

[7] See Affidavit of Marius Schwartz, Competitive Implications of Bell Operating Company Entry into Long-Distance Telecommunications Services, Submitted on behalf of the Department of Justice, In the Matter of Application of SBC Communications Inc. to Provide In-Region Inter-LATA Services in Oklahoma, FCC CC Docket No. 97-121, May 16, 1997, pp. 52-53.

[8] See Schwartz Affidavit, ¶ 47.

obtaining what they need from the BOC."[9] A requirement to show checklist compliance for all three entry modes would be contrary to conventional economic theory. The dispersion of actual entry between the three modes depends critically on the prices and conditions for the UNEs and resold service from the incumbent - which in this case are set by the Michigan PSC. If these prices are too high, entrants will prefer to own their facilities. Conversely, if UNE prices are too low and/or resale discounts too large, entrants will rationally choose to lease UNEs and/or resell the incumbent's services. We cannot predict ex-ante which entry course will be chosen by wily entrepreneurs, and neither can we assume that each mode will be viable. For example, if we do not observe UNE based entry, it could be that such entry is not viable solely because resale discounts have been set too high. Therefore, a finding of "openness" should not be conditioned on observed entry using all three modes, as Professor Shapiro offers no proof that UNE prices and resale discounts in Michigan have been set such that entry using each mode is equally attractive.

10. Professor Shapiro further explains that *"one important indicator of imminent competition in local exchange markets is the expenditure of significant sunk investments by CLECs,"*[10] an unexceptional statement with which we have no quarrel. However, in the precise language favored by economists, this statement should be interpreted as a ***sufficient condition***. That is, substantial sunk investment would be sure proof that the market was irreversibly open. However, it is NOT a ***necessary condition*** as Sprint later claims:

> "as explained by Professor Shapiro, significantly more commitment must be observable to ensure that ... competition has been enabled. ... The public interest test requires the demonstration of sunk investment by CLECs to reflect investment in and commitment to market entry and expansion." [11]

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[9] See Schwartz Affidavit, ¶ 20.

[10] See Shapiro Affidavit, p.17.

[11] Sprint Communications Company L.P., Petition to Deny in the Matter of Application by Ameritech Michigan Pursuant to Section 271 of the Telecommunications Act of 1996 to Provide In-Region Inter-LATA Services in Michigan in FCC Docket CC No. 97-137 at p. 35, quoting in support the Shapiro Affidavit at p. 11.

Even if investment in local exchange facilities enables the lowest cost of service, new competitors may prefer to establish a market presence by relying initially on resale or the lease of UNEs. Indeed, the strategy of entry via resale to build up a customer base before committing to sunk investments is the strategy that MCI used to provide long distance service. The public interest test cannot be construed to require demonstration of sunk investment.

11. Further, Professor Shapiro's interpretation of which sunk assets should be counted is curious:

> "Not all sunk expenditures to provide local telephone services are specific to those services. Investments in facilities that also jointly provide access services and exchange services are less meaningful in inferring [openness] than investment in fully specific assets. ... some investments in local facilities may be recoverable through provision of access services, and not reliant on the full range of interconnection necessary"[12]

Professor Shapiro argues that assets that can be used to provide both access and exchange services should not be included, due to the fact that the owner can recover the cost of the asset solely through access provision. Therefore, the argument continues, these assets are not a commitment to provide local exchange services, and cannot therefore be construed as proof that the local exchange service "market" is irreversibly open.

12. We disagree with Professor Shapiro's contentions. First, if sunk assets are fungible and can provide either access or exchange services, most economists would consider this conducive to competition, as it reduces entry risk and makes the market more contestable. Second, by excluding fungible assets, Professor Shapiro seeks to exclude the most likely entrant investment. In other words, Professor Shapiro simply excludes from consideration in his test of openness all but those investments in the category of sunk assets that the IXCs, by their own admission, are unlikely to pursue for business reasons. For example, MCI states in its brief that

[12] See Shapiro Affidavit, pp. 17-18.

it considers it superior to purchase unbundled switching from Ameritech rather than fund the required investment.[13]

13. Finally, Professor Shapiro's requirement of *"significant sunk investment"* and *"the actual presence of significant facilities-based competitors"*[14] is simply a ruse to reintroduce by the back door a metric test for the lifting of the interLATA restriction, an approach which has been rejected by both Congress[15] and the Department of Justice,[16] as well as by Professor Shapiro himself in previous testimony.[17] This approach is especially pernicious as the metric is not explicit, always leaving the opportunity for commenters' experts to argue that whatever the current level of sunk investment by competitors, it is not enough.

C. Sunk Costs and Fungibility in Local Service Provision

14. Commenters such as Professor Baumol place great emphasis on the fact that local exchange service is not a perfectly contestable market.[18] We do not dispute this very narrow and quite unremarkable finding - very few markets, if indeed any, could be considered perfectly contestable. For example, if one were to start an airline (an oft cited example), one would need to

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[13] MCI Telecommunications Corporation, Petition to Deny in the Matter of Application by Ameritech Michigan Pursuant to Section 271 of the Telecommunications Act of 1996 to Provide In-Region Inter-LATA Services in Michigan, p. 30.

[14] See Shapiro Affidavit, p. 10, p. 17.

[15] See 141 Cong. Rec. H8454 (daily ed. Aug 4, 1995), statement of Rep. Bunn noting that a threshold test, requiring that BOC competitors capture 10% of the local exchange business as a condition for BOC interLATA relief, was explicitly rejected by Congress. See also Brief in Support of Application by Ameritech Michigan in this proceeding, p. 63 note 77.

[16] "'Mr. Klein has stated that he believes no metric test is necessary in the implementation of Section 271,' [Sen.] Burns said," in "Burns and Klein Make up, but Klein's Nomination Still in Doubt," *Telecom A.M.*, Vol. 3, No. 112, June 13, 1997.

[17] "[I]t is simply not true that 'effective local competition...throughout the region' is a necessary condition to ensure that Pacific could not impede competition; it is also not a requirement for Pacific's entry into interLATA services to promote the public interest." Reply Affidavit of Robert G. Harris and Carl Shapiro In Support of Pacific Telesis Group's Request for a Waiver to Permit It to Provide Interexchange Services in Customers in California, (Harris and Shapiro Reply Affidavit), *United States of America v. Western Electric Co., Inc. and American Telephone and Telegraph Company*, Civil Action No. 82-0192, p. 7.

[18] See Baumol Affidavit, ¶¶ 27-32.

make some irrecoverable expenditures, such as hiring pilots and flight attendants, booking advertising, and committing to terminal leases and refurbishment. But contestability is an issue of degree. We may therefore speak of markets being more (or less) contestable than others, and of regulations increasing (or decreasing) the level of contestability of a particular market. The point is that the Act's requirements and the evolution of regulation have succeeded in making the provision of local telephone service in Michigan much more contestable, to the point where we can conceive of hit-and-run entry.

15. Professor Panzar has previously demonstrated that the availability of UNEs has greatly lowered the sunk costs of entry in the provision of local telephone service.[19] We cited this analysis in our previous affidavit, and it appears to stand wholly unchallenged by commenters. UNEs do more than lower sunk costs, they also shift the investment burden to the ILECs. This can be best seen by examining the issue of unbundled loops. In certain areas, subscriber exchange lines, known as "loops," are no longer being provisioned as copper loops. Instead, integrated digital loop carrier (IDLC) has become the technology of choice in certain areas, whereby the many hundreds of exchange lines from individual subscribers are packed onto an optical fiber to be transmitted to the central office. However, when unbundled IDLC "loops" are required by a CLEC, a substantial incremental investment is required to separate out the desired "loops" from the stream of data on the fiber, a process known as "grooming".[20] In these cases, the ILECs bear all of the investment costs for the necessary equipment, and in the best of cases are left to recover it through unbundled loop rates. This investment would be stranded if demand for unbundled loops were to decrease, perhaps because of a shift in demand to resold service or CLEC self-supplied loops, neither of which require loops to be groomed.

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[19] See Reply Affidavit of John C. Panzar, in support of Ameritech's Motion to Remove the Decree's Interexchange Restriction, *US v. Western Electric*, No. 82-0192, D.D.C., filed April 1994.

[20] We note that there is considerable debate on the exact magnitude of this investment. However, there is no doubt that it exists and that it is non-trivial.

16. Finally, we reiterate that a clear distinction must be made between sunkenness and fungibility. An asset may be irrecoverable, and hence sunk - but it also may be fungible, i.e., it could be used to provide a service other than the one for which it was created. As we noted above, Professor Shapiro claims that because certain sunk investments are fungible between access provision and local exchange provision, they should be disregarded for the purposes of assessing market openness, and that one should therefore consider only switching-specific investment. We also rejected this contention, pointing out that increased fungibility serves only to increase contestability. What Professor Shapiro and other commenters do not realize is that while in some cases local switching assets may be sunk and non-fungible for purposes other than switching, should an entrant need to exit the particular market originally entered, the entrant's switching capacity, now rendered excess, would be fungible both geographically and across services.

17. Because of significant advances and dramatic cost reductions in transmission technology, the end-office providing dialtone to the customer no longer needs to be located in geographical proximity to the customer. Typical examples are MFS providing local exchange dialtone in Delaware and Maryland from a switch in Pennsylvania, and Continental providing service in Illinois in an Ameritech local exchange area using Ameritech unbundled loops and its own out-of-region switch. An extreme example is GTE's cellular operation in Northern California, where GTE Wireless customers enjoy a 54,000 square mile local calling area extending from the Oregon-California border to Santa Barbara, all served from a single wireless switch based in Walnut Creek, Ca. Similarly, with the advent of cheap fiber transport, an entrant's switching investment to provide exchange service in Detroit can be redeployed "virtually" to provide exchange service in Grand Rapids, if market conditions in Detroit changed adversely. Although the switching asset is sunk, its capacity is fungible across many distant geographical markets, which makes entry deterrence more difficult.

18. Advances in switch technology are also erasing the distinction between different classes of switches. A decade ago switches were quite clearly end-office, tandems, or mobile telephone switches. No longer. The most recent offerings from Lucent and Northern Telecom can combine all these features as needed. For example, NT's DMS-500 can serve simultaneously as a local or long-distance switch, while a Lucent 5ESS switch can be transformed from a wireline end-office switch to a wireless or dual-capability switch with the addition of some modular equipment.[21]

19. We therefore conclude that the availability of UNEs has greatly reduced the level of sunk costs in local service provision and shifted part of the investment burden to incumbent LECs. Meanwhile, advances in telecommunications technology have greatly increased the fungibility of the assets involved across geography and services. Both changes contribute to a dramatic increase in the contestability of this industry. Therefore, many of the Bell System exclusionary strategies which may have worked in the days before the MFJ would not work now.

D. Ameritech and Irreversibility

20. In light of the DOJ's emphasis on the need for local markets to be irreversibly open, we note that Ameritech does not have the unilateral power to reverse the process. UNE prices have been and will continue to be set by the MPSC based on the cost-based standard of the Act. The Act eliminates statutory local service monopolies and mandates Ameritech to make interconnection, resale, UNEs, OSS, local number portability and dialing parity available indefinitely to its competitors on a non-discriminatory basis. Thus, it is difficult to see what Ameritech could possibly do to reverse the openness of the local market. We therefore argue that

[21] See *Telesis*, N. 100, October 1996, NORTEL/BNR, p. 30, and "PCS: The New Business of Wireless," *Telephony*, September 16, 1996: "Lucent's 5ESS switch has proven to be nimble with landline, cellular, and PCS, experiencing the least amount of downtime of three switches studied. The 5ESS earns its keep because it simultaneously supports wireline and wireless services, giving service providers a financial and operational head start."